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(54) Abstract Title
Document platforms

(57) It is known to provide document platforms, for example, a photocopying machine or a printer, in which the identity of an authorised user is verified before the machine can be operated. Described herein is a document platform (10) comprising main machine architecture (20) and a user interface (30) incorporating a fingerprint sensor (40). Processing circuitry (50) is provided for the fingerprint sensor (40) including a central processing unit (52) which compares a temporarily stored fingerprint in memory (54) for a prospective user with fingerprints of authorised users stored in a non-volatile memory (58). If a match is obtained, an operational signal to the main machine architecture (20) allows the user access to the platform (10). If no match is obtained, access is prevented.

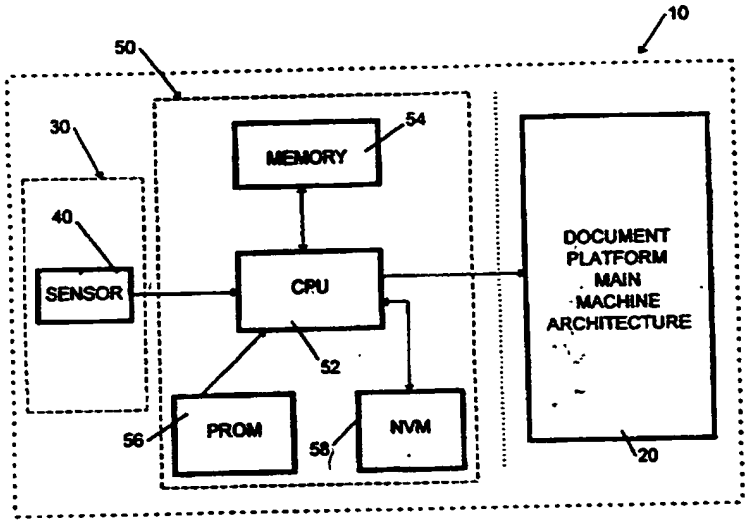

Fig. 1

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IMPROVEMENTS IN OR RELATING TO DOCUMENT PLATFORMS

The present invention relates to improvements in or relating to document platforms, and is more particularly concerned with providing user access to such document platforms.

Document platforms may comprise photocopying machines, printing machines, fax machines, scanning machines or multi-function systems which incorporate one or more of these machines.

It is known to provide systems in which the identity of an authorised user of a machine, for example, a photocopying machine or a printer, is verified before the machine can be operated. Such systems are often provided where the machine is networked and include 'log on' procedures which may be both complex and time consuming for the user.

It is therefore an object of the present invention to provide a system in which a user can readily be identified and authorised to operate the machine.

In accordance with one aspect of the present invention, there is provided a document platform including a user interface and main machine architecture, characterised in that the user interface includes a fingerprint sensor and in that the platform includes processing circuitry associated with the fingerprint sensor.

The processing circuitry may be separate to the main machine architecture, or integrated therewith.

The term "main machine architecture" refers to the main control systems of a machine which can be classed as a document platform.

The document platform in accordance with the present invention has the advantage that authorised users can gain rapid access thereto removing the need for personal identification numbers (PINs) and passwords etc. Moreover, by utilising fingerprint technology, increased security in relation to access to the document platform is obtained.

For a better understanding of the present invention, reference will now be made, by way of example only, to the accompanying drawings, in which:-

Figure 1 is a schematic illustration of a document platform incorporating the present invention in a 'stand alone' configuration; and

Figure 2 is a schematic illustration of a document platform incorporating the present invention as part of the main machine architecture.

The present invention provides a document platform which is capable of verifying the identity of its user. The user interface on the platform incorporates a fingerprint sensor which, when set to recognise particular fingers of each user in a predetermined set, allows only access to users in that set.

Figure 1 illustrates a document platform 10, for example, a photocopying machine, which comprises main machine architecture (MMA) 20, a user interface 30 incorporating a fingerprint sensor 40, and processing circuitry 50 for the fingerprint sensor 40. The MMA 20 controls the

operation of the document platform 10 and is connected to the user interface 30 (the connection not being illustrated for clarity). The user interface 30 comprises a keyboard or keypad through which operation of the document platform 10 can be programmed, for example, through instructions provided to the MMA 20. The fingerprint sensor 40 is located on the user interface 30 to provide easy access for a user. The fingerprint sensor 40 is connected to its own processing circuitry 50 which is independent of the MMA 20. The processing circuitry 50 comprises a central processing unit (CPU) 52, a memory 54, a programmable read only memory (PROM) 56 and a non-volatile memory (NVM) 58. The CPU 52 is connected to receive signals from the fingerprint sensor 40 and to transmit signals to the MMA 20. Connections are also made between the CPU 52 and memory 54, PROM 56 and NVM 58 as shown. The PROM 56 stores fingerprint recognition software and the NVM 58 stores codes corresponding to the fingerprints of authorised users.

In operation, the processing circuitry 50 has a 'learn' mode and a 'normal' mode. In the 'learn' mode, an initialisation procedure is initiated so that the circuitry 50 is in communication with the MMA 20. The initialisation procedure is implemented as software and may be stored on an optical disk or other suitable storage means. Once initialisation has occurred, the MMA 20 sends signals to the user interface 30 to prompt the new user to enter a new user name. The new user name is entered into the user interface 30. The new user is then prompted to place a selected finger, for example, the index finger, the middle finger, or the ring finger, onto the fingerprint sensor 40 located on the user interface 30. The sensor 40 scans the presented finger and generates a digital fingerprint code which is stored in the NVM 58 together with the new user's name. A unique 'go code' is associated with each fingerprint code and is also stored in the NVM 58. The unique 'go code' for each authorised user is also stored in the MMA 20 as an enabling signal for the operation of the document platform 10.

In the 'normal' mode, the user interface 30 prompts the user for the user name under control of the MMA 20. Once the name has been entered on the user interface 30, the user is prompted to place the selected finger onto the fingerprint sensor 40. The sensor 40 scans the presented finger and generates a fingerprint code which is temporarily stored in memory 54. The CPU 52 retrieves the fingerprint code for the authorised user which has previously been stored in the NVM 58 and compares it with the fingerprint code stored in memory 54. If there is a match, the CPU 52 transmits the unique 'go code' for that user to the MMA 20 thereby allowing the user access to the document platform 10. If there is no match between the fingerprint code stored in the NVM 58 and that stored in the memory 54, the CPU 52 transmits either a 'stop code' or no signal to the document platform 10 and access is denied.

Figure 2 illustrates another document platform 60 in which the processing circuitry for the fingerprint sensor 40 is incorporated in the MMA. Identical components in Figures 1 and 2 are referenced alike. The document platform 60 comprises MMA 70 and a user interface 30 incorporating a fingerprint sensor 40. In this embodiment, processing circuitry 80 for the fingerprint sensor 40 is incorporated into the MMA 70. The processing circuitry 80 includes a central

processing unit (CPU) 82, a memory 84, a programmable read only memory (PROM) 86 and a non-volatile memory (NVM) 88. The CPU 82 is connected to a fingerprint sensor 40. The CPU 82 is connected to receive signals from the fingerprint sensor 40. As the processing circuitry 80 forms part of the MMA 70, the CPU 82 interacts directly with the MMA 70 to provide signals thereto according to the input from the fingerprint sensor 40. Connections are also made between the CPU 82 and memory 84, PROM 86 and NVM 88 as shown. The PROM 86 stores fingerprint recognition software and the NVM 88 stores codes corresponding to the fingerprints of authorised users.

As described above with reference to Figure 1, the processing circuitry 80 has a 'learn' mode and a 'normal' mode. However, in the 'learn' mode for the arrangement shown in Figure 2, there is no need for an initialisation procedure as the processing circuitry 80 forms part of the MMA 70 and there is constant communication between the processing circuitry 80 and the MMA 70.

Once the 'learn' mode has been established, the MMA 70 sends signals to the user interface 30 to prompt the new user to enter a new user name. The new user name is entered into the user interface 30. The new user is then prompted to place a selected finger, for example, the index finger, the middle finger, or the ring finger, onto the fingerprint sensor 40 located on the user interface 30. The sensor 40 scans the presented finger and generates a digital fingerprint code which is stored in the NVM 88 together with the new user's name.

In the 'normal' mode, the user interface 30 prompts the user for the user name under control of the MMA 70. Once the name has been entered on the user interface 30, the user is prompted to place the selected finger onto the fingerprint sensor 40. The sensor 40 scans the presented finger and generates a fingerprint code which is temporarily stored in memory 84. The CPU 82 retrieves the fingerprint code for the authorised user which has previously been stored in the NVM 88 and compares it with the fingerprint code stored in memory 84. If there is a match, the CPU 82 interacts with the MMA 70 thereby allowing the user access to the document platform 60. If there is no match between the fingerprint code stored in the NVM 88 and that stored in the memory 84, the CPU 82 does not interact with the MMA 70 and access to the document platform 60 is denied.

It will readily be appreciated that the CPU 82, memory 84, PROM 86 and NVM 88 may be components already present in the MMA 70 which are utilised for the additional function of fingerprint recognition/verification.

Document platforms 10, 60 have been described above as operating for user verification in the 'normal' mode, that is, a user name is required as well as the fingerprint code. It will readily be appreciated that each MMA 20, 70 can also be configured for operation for user recognition in the 'normal' mode. In such this case, an authorised user wanting to use the document platform 10, 60 need only touch the fingerprint sensor 40 in the user interface 30 with the appropriate finger to be recognised and given access to the platform 10, 60.

As mentioned previously, simplified interface/log on procedures are provided which is faster, more secure and provides automatic authentication. For example, if the document platform

is a printer, a secure print can be obtained therefrom if it is set up so that a print job is only released when the authorised user touches the fingerprint sensor. Moreover, continuous identity checks can be automatically carried out for document platforms which have time-out and screen saver modes.

A document platform in accordance with the present invention also provides for itemised billing - the user billing every use either to a personal account or to another authorised account. Moreover, provision may be made so that the status of any account can be viewed by an authorised user thereof.

Personal directories, for example, distribution lists, e-mail directories, personal fax/telephone books and web addresses, may be stored in the memory of the platform, these directories being accessed through the recognition/verification of a user by the processing circuitry associated with the fingerprint sensor.

Customised authorised user preference set ups can also be stored and accessed as required, for example in a platform including a photocopying facility, double-sided copying and automatic stapling. Scan templates can also be provided in document platforms which include scanning equipment.

In networked document platforms, the present invention provides the system administrator with greater device security and allows the setting of machine configurations and preferences without having to enter passwords for each of the configurations/preferences. The system administrator can also gain access to usage information for the machine to order supplies etc.

It will readily be appreciated that the processing circuitry included in a document platform in accordance with the present invention could also be used to record the fingerprints of any unauthorised person trying to use the document platform.

CLAIMS:

1. A document platform (10; 60) including a user interface (30) and main machine architecture (20; 70), characterised in that the user interface (30) includes a fingerprint sensor (40) and in that the platform (10; 60) includes processing circuitry (50; 80) associated with the fingerprint sensor (40).

2. A platform according to claim 1, wherein the processing circuitry (50) is separate to the main machine architecture (20).

3. A platform according to claim 1, wherein the processing circuitry (80) is integrated with the main machine architecture (70).

4. A platform according to any one of claims 1 to 3, comprising a photocopying machine.

5. A platform according to any one of claims 1 to 3, comprising a printing machine.

6. A platform according to any one of claims 1 to 3, comprising a multi-function machine.

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The Patent Office

Application No:	GB 9724962.7	**Examiner:**	Mike Davis
Claims searched:	1-6	**Date of search:**	24 February 1998

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.P): G4H (HTG)

Int Cl (Ed.6): G07C, G06F, G06K

Other: Online: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	US 5598474	(JOHNSON) see column 6 lines 46-57	1-6
X	JP 090300715	(BROTHER)	1,5 at least

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

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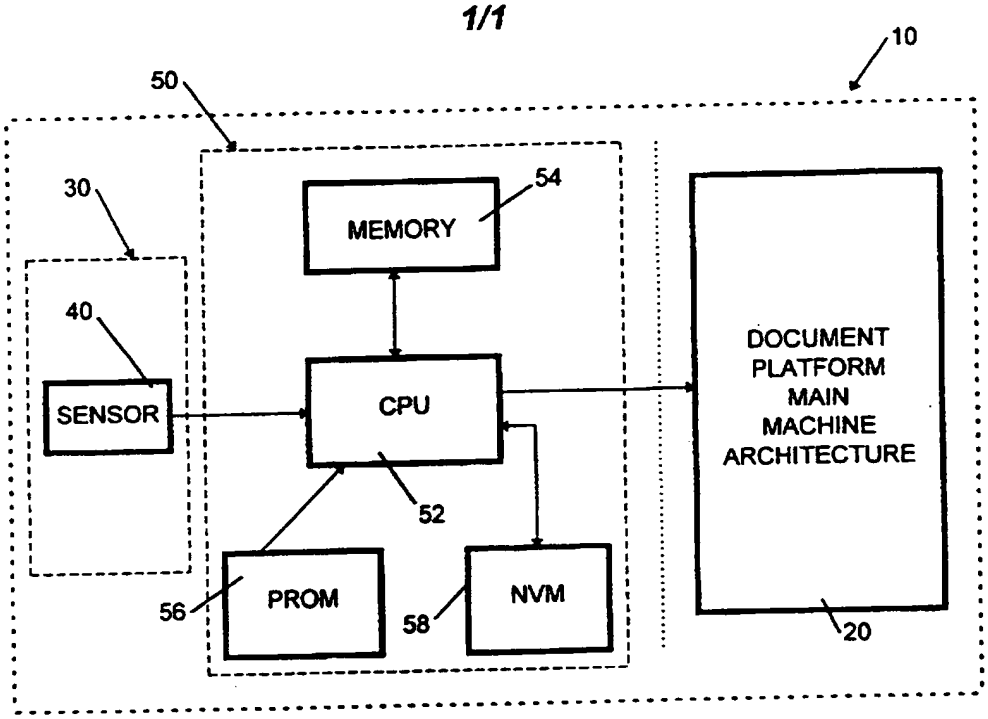

Fig. 1

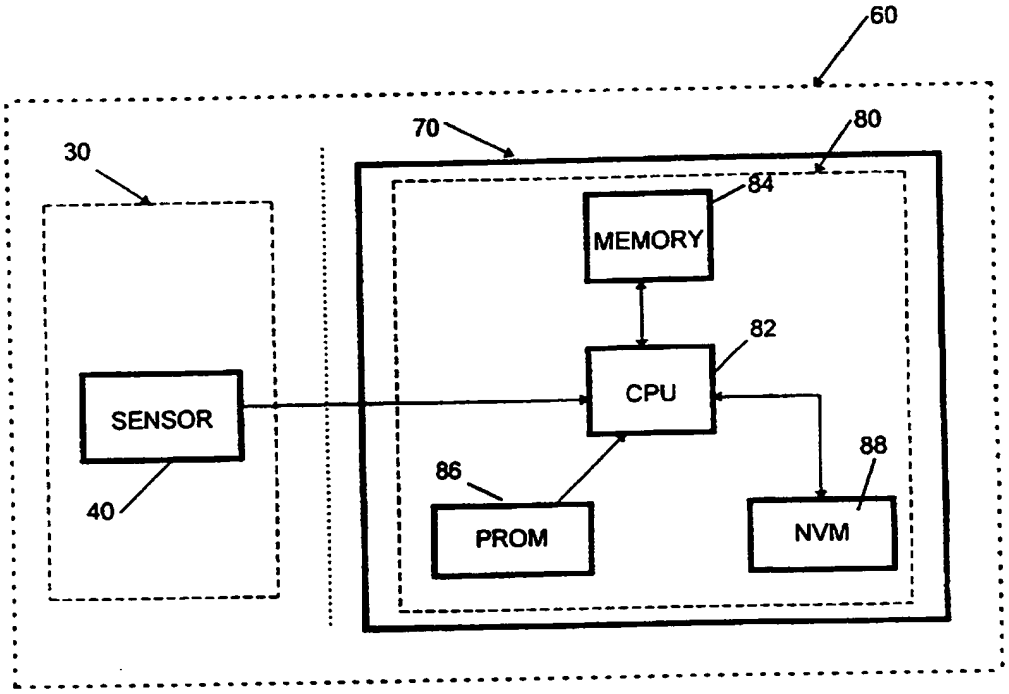

Fig. 2

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